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Review Article

A SYSTEMATIC OVERVIEW ON –PARPATI KALPANAS

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ABSTRACT

Rasa Shastra (science of alchemy) deals with *Parada* (mercury) and it is considered to be the heart of *Rasa Shastra*. In fact, the whole science is under the influence of physical and chemical properties of *Parada*. *Rasa Shastra*, one of the Pharmaco-therapeutic branches of Ayurved, incorporates many of the Herbo-mineral-metallic pharmaceutical preparations prepared out of the *Parada* namely *Khalviya Rasayana* [medicine is prepared grinding the ingredients in a *Khalva Yantra* (comparable with mortar and pestle)], *Parpati Rasayana* (thin flake like medicines), *Pottali Rasayana* (medicines prepared in cloth) and *Kupipakwa Rasayana* (Medicines prepared in bottle) respectively. The Historical evidences of *Parpati Kalpana* ways back in the 11th Century having references from Chakradatta written by Acharya Chakrapani. The term *Parpati* (thin flake like medicine) has been used in many context of *Rasa Shastra*. *Parpati* is a thin Flake like preparation consisting of *Parada*, *Gandhaka* (sulphur) and other drugs which are developed from *Parada*. This Preparation of *Parada* consist therapeutically effective minerals and metallic formulations which includes both *Sagandha* (with sulphur) and *Nirgandha* (without sulphur) *Parada Murchita Yoga* (medicines prepared out of mercury). *Parpati Rasayanas* have high therapeutic value, potency, less toxicity and cost effective preparations. Many works have been done on *Parpati* related to its pharmaceutical, clinical and literary part but so far, there is no work on *Parpati Kalpana*. Considering detailed review on Pharmaceutical and Analytical Parameters applicable for *Parpati* preparations. So, in this paper an honest attempt has been made to have a systematic overview of *Parpati Kalpanas*.

KEY WORDS: *Rasa Shastra*, *Parpati Kalpanas*, *Murchita Parada Yogas*, Pharmaceutical and Analytical Parameters.

INTRODUCTION

Rasa Shastra, a boon of Ayurved popular from medieval period, mostly deals with therapeutic utilization of metals and minerals, numerous formulations are mentioned in our *Shastra* with the permutation and combination of *Parada* along with other ingredients. According to recent concepts, mercury and its compounds are highly toxic. As per *Rasa Shastra*, *Parada* i.e. Mercury is considered as most potent substance. It has *Shadrassa* (6 tastes) and balances *Tridoshas* (three Bodily humours). These properties are exhibited in compound form such as *Khalviya Rasayana*, *Parpati Rasayana* etc. *Parada* is mainly used

after subjecting to *Moorchana*. *Sagandha Moorchana* is preferred as it is more efficient.^[1,2] The compounds prepared with *Parada* (mercury) are considered to be the best. It has been a practice for many years to combine Mercury and Sulphur with other drugs or metals for enhancing their potency. *Parpati Kalpana* is a well known and successfully used preparation for the management of *Grahani* (sprue syndrome). Before the invention of *Parpati*, *Grahani* was considered difficult to cure but after the invention of *Parpati* it became curable. The use of *Parpati* was found beneficial for alleviating associated symptoms of *Grahani*

as well as various other diseases like *Rajayakshma* (tuberculosis), *Kustha* (skin disorders), and *Gulma* (tumor) etc. *Parada Moorchna Yogas* classification is mentioned in Figure no-1^[3,4]

A. Etymology

The Sanskrit word "*Parpati*" denotes a thin flake like preparation. "*Parpati*" indicates a preparation which is thin, brittle and has a shape of thin *Papad*. By heating *Kajjali* (HgS) is transformed into a thin, flat preparation. In practice though it possesses a thin, flat shape, it is first powdered and then used for medicinal purpose. The texts like "*Rasatarangini*" also mention "*Parpati*" as "*Parpatika*", meaning the same. But a reference in "*Bharat Bheishajya Ratnakara*" denotes "*Parpatika*" as the bits and fragments left in an iron vessel, while preparing the *Parpati*. As it undergoes more heating, than required, it loses its medicinal value. *Parpati* is a thin flake like preparation which is developed from "*Pota Bandha*", consisting of *Parada*, *Gandhaka* and other drugs [It may be *dhatu-bhasmas* (ash of metals-non metals) or *Kashthaushadis* (ash of herbal drugs)].^[5]

B. History

Acharaya Nagarjuna's treatise written in 8th Century named *Rasendra Mangala* explanations of *Parpati* in *Kustha Roga* is found. Later, *Chakradatta* written by Acharaya Chakrapani which is considered to be the treatise of 11th Century has explained *Parpati* and highlighted it as *Rasa Parpati* which is indicated in the *Grahani Roga*. Thereafter, *Bhaishajya Ratnavali* written by Acharaya Govind Das Sen which is the text of 19th Century explains many *Parpatis* and while explaining *Rasa Parpati* he has mentioned that *Shivatsanka Nirmita Rasa Parpati* is considered to be the best showing the invention of *Parpati*.^[6]

C. Synonyms

- *Parpat:* - like *Papad*
- *Parpati:* - thin flake
- *Parpatika:* - thin and brittle flake
- *Pota Bandha:* - adhesions or to give support

D. Nomenclature of different *Parpati Kalpanas*

- If *Parada* and *Gandhaka* is used then it is called as- *Rasa Parpati*.

- If *Parada- Gandhaka* is mixed with any *dhatu/loha*, then it is named on the basis of *dhatu bhasma* used. Ex-
 - Use of *Lauha Bhasma- Lauha Parpati*
 - Use of *Tamra Bhasma- Tamra Parpati*
 - Use of *Suvarna Bhasma- Suvarna Parpati*.
- If *Parada- Gandhaka* is mixed with any *Kasthaushadhi* like *Bola- Bola Parpati*.
- Depending upon number of ingredients used like- *Panchamrita Parpati* (use of 5 drugs), *Saptamrita Parpati* (use of 7 drugs).
- Depending upon the results like- *Kusthanta Parpati*. (Useful in Skin disorders)
- Depending upon the colour and quality of ingredients like- *Shweta Parpati* (White in colour)
- Depending upon the person who prepared the *Parpati* like- *Bhairvnatha Parpati*.

MATERIALS AND METHODS

A. Importance of *Parpati* Preparation

- *Parpati Kalpana* is one such method described among the 25 other *Parada Bandha* methods, which means to control the movement and fragility of the *Parada*.
- In the procedure of *Parpati Kalpana*, heat application is conducted; therefore heat energy may enhance its therapeutic efficacy in treating many GIT disorders.
- Application of *Gomaya* (cow dung), which comes from the alimentary canal of the cow and may have some enzymatic activity.
- With the use of *Ghee* smeared leaves we can easily scrap out the *Parpati*, and also ghee is useful in treating indigestion, hence may have a synergistic effect along with *Parpati*.^[7]

B. Basic Principles behind preparation of *Parpati Kalpana*

1. *Samanaya* (general purification) or *Vishesha Shodhan* (special purification) of the ingredients.
2. Homogeneous mixture of the ingredients.
3. Main preparation of the *Parpati*.^[8]

TABLE NO-1 DIFFERENT TYPES OF PARPATI (BASED ON THE DRAVYA USED)

Type-1. Based upon use of <i>Kajjali</i> and other ingredients	Type-2. Based on procedure and ingredients used
1. <i>Parpati</i> containing only <i>Kajjali</i> (<i>Parada</i> and <i>Gandhaka</i>)- Ex. <i>Rasa Parpati</i>	<i>Sagandha Parpati</i> : Containing <i>Parada</i> and <i>Gandhaka</i> - ex: <i>Rasa Parpati</i> , <i>Tamra Parpati</i> , <i>Loha Parpati</i> , <i>Bola Parpati</i> , <i>Panchamrita Parpati</i> etc.
2. <i>Parpati</i> containing <i>Kajjali</i> with one or more <i>loha</i> / <i>dhatu</i> . - Ex. <i>Tamra Parpati</i> , <i>Panchamrita Parpati</i> , <i>Loha Parpati</i> , <i>Vijaya Parpati</i> etc.	<i>Nirgandha Parpati</i> : Without <i>Parada</i> and <i>Gandhaka</i> - ex: <i>Shweta Parpati</i> , <i>Malla Parpati</i> etc.,
3. <i>Parpati</i> containing <i>Kajjali</i> and one or more <i>Kasthaushadhi</i> . - Ex: <i>Pranada Parpati</i> , <i>Bola Parpati</i> .	

C. Methodology

(General Method of *Parpati* Preparation)

After performing the purification methods of *Parada* and *Gandhaka*, they are taken in an iron mortar and *Kajjali* is prepared till all *Lakshanas* are achieved For E.g.- Physical Signs like *Kajjalabhasa* (Blackish), *Slakshan* (smooth), *Anjan Sadrisa* (like Collyrium), *Sukshma* (minute), *Rekhapurnatva* (Grooves in lines of fingers), Chemical Signs like *Jala Pareeksha*, *Agni Pareeksha*, *Loha Pareeksha* etc. Thereafter as per the requirement and depending upon the type of *Parpati Kalpana*, other drugs are added to and proper *Mardan* (trituration) in an iron mortar is carried out till it becomes a uniform homogeneous mixture.

Later on, the mixture is taken in a ghee smeared iron pan and heated over *Mandagni* (Low fire). After achieving uniform melting immediately transfer the melted contents to a clean *Kadali patra* (banana leaf) placed over a bed prepared out of *Gomaya* (cow dung). Then cover the content with another *Kadali patra* and little amount of fresh *Gomaya* is spread over it then pressed gently and allowed it to cool and flakes of *Parpati* are taken out. Colour and Appearance of the *Parpati* depends upon the kind of ingredients used in the pharmaceutical preparation. With the pressing of *Kadali Patra*, the impression should be seen on the *Parpati* prepared. After the completion of the procedure, the flakes are kept for drying and powdered and preserved in an air tight glass bottle/jar.^[9,10]

D. Precautions

- *Gandhaka* (Sulphur) is highly combustible substance. Hence *Parpati* should not be prepared on *Teevragni* (High grade fire) as there are chances of catching fire.

- Some amount of *Sneha* is to be smeared to the iron pan (*Lauha Darvi*) and *Kadali Patra* used for preparation.
- *Kajjali* is heated up to semisolid form or till it becomes *Pankavatta* (Like Mud).
- Press *Kajjali* immediately after transferring on to the *Kadali Patra* which is spread over bed of *Gomaya*.

E. Use of materials and their importance in the *Parpati Kalpana* preparation

1. ***Lauha Darvi* (iron pan):** - To prepare *Parpati*, *Kajjali* is liquefied on *Agni* with the help of *Lauha Darvi*. In some texts, use of even *Tamra Darvi* (copper vessel) is also advised. (*Lauha Darvya Kshipeta*- in *Rasa Tarangini*) and (*Lauha Patre athva Tamre*- in *RasaYoga Sagar*)
2. ***Agni*:** - It plays a very important role in the preparation of *Parpati*. *Mridu Agni* (Low fire) is required to liquefy *Kajjali*. *Paka Karma* (Cooking) is done till *Kajjali* attains *Pankvatta* stage i.e. Muddy appearance. (*Sutam Panka samam vilapayam ruchiram paka kriya kovidam*- in *Rasa Tarangini*)
3. ***Ghrita*:** - Prevention of adherence of *Kajjali* to the Iron pan and preventing the *Kadali Patra* from burning. It also plays an important role of giving *soumya* and *snehatva* quality to the *Parpati*.
4. ***Gomaya* (cow dung):** - *Gomaya* bed acts as a cushion for pressing and moreover *Parpati kalpana* is usually prescribed for the treatment of the *Pittaja Vyadhis* (diseases of Pitta origin) and *Jatharagni mandya rogas* (Diseases of Digestive fire). Use of Fresh *Gomaya* increases the potency of the medicine. It contains maximum ratio of

billiary products which in turn during preparation of *Parpati* gets absorbed in to the heated *Kajjali* through the *Patra* media and thus helps to regulate the billiary ailments and other *Pittajanya vyadhis* (diseases).

Properties of Cow dung- The main constituent of cow dung is debris from cells within the digestive tract and secretions from the body such as salts, sloughing of animal cells and mucus. Feces also include undigested diet comprising cellulose and lignin, originating from the cell walls of the plants.

5. **Patra:** - Use of *Patras* (leaves) like *Kadali Patra* (banana leaf), *Eranda Patra* (castor leaf) etc in the preparation increases the potency of the drug. Use of *Kadali Patra* gives the *Kashaya* quality to the *Parpati*. Use of

such leaves which are highly rich in chlorophyll gets absorbed into the formulation and exerts therapeutic effects on human systems especially on G.I.T.

Properties of Chlorophyll- One of the best Anti-oxidants, able to neutralize the negative effects of free radical in the body, helps prevent many degenerative diseases and maintain the body stronger. Chlorophyll helps cleanse the body toxins. [11, 12]

F. *Parpati Paka*

While describing *Parpati* preparations, 3 *Pakas* (stages) have been mentioned in the texts i.e., *Mridu* (soft) *Madhyama* (medium) and *Khara* (severe) *paka*. In these *Mridu* and *Madhyama paka* preparations are the best to be used in therapeutically. The *Parpati paka lakshanas* (Stages of *Parpati* cooking) are mentioned in Figure No-2 [13, 14]

TABLE NO-2 *PARPATI PAKA STAGES*

<i>Paka Kalina Pareeksha</i>	<i>Paka Paschata Pareeksha</i>
<i>Mridu paka</i> : When melted <i>Kajjali</i> attains <i>Mayura Chandrika varna</i> (like peacock feather).	<i>Mridu paka</i> : It is very soft smooth and bends on breaking, black in colour and shining is less.
<i>Madhyama paka</i> : If melted <i>Kajjali</i> attains <i>Taila</i> (oily) consistency.	<i>Madhyama paka</i> : Black coloured with proper shining. I.e. while breaking, on the edges shinning silver colour is seen.
<i>Khara paka</i> : If melted <i>Kajjali</i> attains <i>Rakta varna</i> (Reddish colour).	<i>Khara paka</i> : It attains the blackish brown colour instead of black colour. Mostly burnt pieces and powder will be observed. It should be discarded because it can acts as <i>Visha</i> .

G. Doses and Rules for *Parpati Kalpana* intake

In our classics we can get many references regarding *matra* (dose) and how to use *Parpati* preparations internally, but basically there are 2 types of *Parpati* intake regimens.

1. *Samanya prayoga* (General use)
 2. *Kalpa or Vardhamana prayoga* (Gradual use)
- **Samanya Prayoga:** - *Parpati* is prescribed in a dose of 1-2 *Ratti* (125-250 mg) mixed with fried *Jeerak* (Cumin seeds) and *Hingu* (Asafetida) in divided doses. In this way of use dietetic restriction is not necessary, in case of *Unmada* (Insanity) and *Apasmara* (Epilepsy) the starting dose mentioned is 8 *Ratti* per a day.
 - **Kalpa Prayoga or Vardhamana Prayoga:** - Many references we can get from our classics, these are highlighted below

1. Reference from *Rasa Tarangini*: -In the text it has been stated that 2 *Ratti* (250 mg) *Parpati* preparations is given as a starting dose and increased gradually up to 10 *Ratti* (2500 mg). [14]
2. According to *Acharaya Chakrapani*: - *Parpati* dose is started from the dose of 2 *Ratti* (250 mg) and then increased gradually up to 12 *Ratti* (3000 mg) [15]

Description of *Kalpa Prayoga/ Vardhaman Prayoga*

Parpati preparations should be administered in 2 *Ratti* dose (250 mg) initially and then increase it by 1 *Ratti* (125 mg) daily or alternate days till 10 *Ratti* (2500 mg) is reached. This dose should be continued till the ailment is cured and then the dose may be reduced by 1 *Ratti* (125 mg) daily till it becomes again 2 *Ratti*

(250 mg). This is a common procedure to be followed for all types of *Parpati* while using as *Kalpa Prayoga*. In this way it takes around 40 days for a *Kalpa Prayoga* usage.

Depending upon the severity of disease and strength of the patient, it can be used for 36 days, 40 days, 60 days or 96 days. This 36/40/60/96 day's scheduled period is called as *Mandala/Chakra*. The quantity of *Parpati* consumed when used for 36 days *chakra* is 188 *Ratti*, for 40 days 310 *Ratti*, 60 days – 480 *Ratti*, 90 days – 768 *Ratti*. Now which type of *Mandala* is to be used for the patient depends upon the physician to decide. If needed, it can be repeated for 2, 3 or more times as per requirement. [16-18]

H. Pathya- Apathya (Do's and Don'ts) during Parpati intake as medication

1. Pathya

In Rasa Tarangini there are list of drugs mentioned which are to be taken during *Parpati sevan*, they are, *Kakamachi* (Black night shade), *Patola* (Pointed gourd), *Pugiphal* (Betel nut), *Ardarak* (Ginger), *Kadalipuspha* (Banana flowers), *Brinjal*, *Old Shalidhanya*, *Godugdha* with *Sharkara*.

I. Uses of Parpati preparations in different diseases along with various Anupanas (Vehicles) [22-23]

<i>Unmada Roga</i> (Insanity)	:	<i>Rasnamool churna</i> and <i>Goghrita</i> .
<i>Apasmara Roga</i> (Epilepsy)	:	<i>Brahmi swaras</i> and <i>Trikatu churna</i>
<i>Sangrahani Roga</i> (type of GIT disorder)	:	<i>Shweta Jeeraka churna</i> and <i>Hingu</i> .
<i>Udara shula</i> (Abdominal pain)	:	<i>Eranda beeja taila</i>
<i>Pandu with shotha</i> (Anemia with Inflammation)	:	<i>Guggulu churna</i>
<i>Kustha</i> (Skin disorders)	:	<i>Nimba panchanga</i> , <i>Bakuchi</i> and <i>Bhringaraj churna</i>
<i>Vatajwara</i> (Vatik type of fever)	:	<i>Dashmula Kwatha</i>
<i>Kasa</i> (Cough)	:	<i>Trikatu Churna</i>

J. Parpati preparations classification

Many different *Parpati* preparations are mentioned in our classics which are having different ingredients and are being used in different ailments. Such classification is mentioned below in Table No-3: [24-27]

TABLE NO-3 DIFFERENT PARPATI MENTIONED IN OUR CLASSICS

S.No	Type of Parpati preparation	Ingredients and Quantity	Dose and Anupana	References	Indications
1.	<i>Panchamrita Parpati</i>	<i>Sh. Parada</i> - 4 Masha <i>Sh. Gandhaka</i> - 8 Masha <i>Loha Bhasma</i> - 2 Masha <i>Abhrak Bhasma</i> - 1 Masha <i>Tamra Bhasma</i> -	2 Ratti (250 mg) with Ghee, Ksheer, Madhu	<i>Bhaishjya Ratnavali</i> - <i>Grahani</i> 468-479	<i>Grahani</i> , <i>Aruchi</i> , <i>Chardi</i> , <i>Dushta Arsha</i> , <i>Atisara</i> , <i>Raktapitta</i>

2. Apathya

In Rasa Tarangini there is mentioning of avoidance of river water or well water for drinking during *Parpati Kalpana* medication as it increases the severity of disease. Patient is advised to drink plenty of *Takra* (Buttermilk). There are certain things which are contraindicated like *Amla sevana* (Intake of Sour things), *Shita Jala Snana* (Bathing with cold water), *sita vayu sevana* (Exposure to cold winds), *krodha* (Anger), *chinta* (Tension/Stress), *usna dravya sevena* (Intake of hot substances), *tikta dravyas* (bitter drugs) like *Nimba* (Neem), sweet substance like *Guda* (Jaggery), *Anupa mamsa* (Aquatic/frozen meat), *stree sambhasana* (Sexual activities) etc.

According to Acharaya Chakrapani, after intake of *Parpati* preparation the patient should chew lots of betel nut in a day. On 3rd day patient is allowed to take meat, ghee, milk but avoid *Vidahi anna*, sexual intercourse, banana root, mustard oil, small fish and aquatic birds. The patient should take water after waking up in early morning. [19-21]

		4 Ratti			
2.	Loha Parpati	Sh. Parada Sh. Gandhaka Kanta Loha Bhasma (All equal parts)	1-2 Ratti (125-250 mg) with Sheeta Jala, Dhanyaka and Jeerak kwath	Bhaishjya Ratnavali- Grahani 444-452	Grahani, Ama shula Atisara, Pandu, Kamala, Pleea roga, Agnimandya, Bhasmaka roga, Kustha, Udavarta, Amavata
3.	Swarna Parpati	Sh. Parada- 4 parts Sh. Gandhaka- 4 parts Swarna bhasma - 1 part	1 Ratti (125 mg) with Brishta Jeeraka churna and Madhu	Bhaishjya Ratnavali- Grahani 454-457	Grahani vikara, Rajyakshma, 18 types of shula, Vrishya.
4.	Tamra Parpati	Sh. Parada - 3 parts Sh. Gandhaka - 3 parts Tamra Bhasma - 3 parts Sh. Vatsanabha - 1 part	2-3 Ratti (250-375 mg) with Ardraka swarasa, Triphala Kwatha, Eranda Taila, Kumari swarasa, Bakuchi Churna, Triphala Churna, Khadira Kwatha.	Rasa Ratna Samuchya- Chapter 20 Shloka 134	Kasa, Shwasa, Jwara, Pandu, Krimi roga, Yakshma, Kustha Shula, Grahani roga, Yakrita vikara, Pleea Vriddhi, Atisara and Vata- Kapha roga.
5.	Vijay Parpati	Sh. Parada- 4 parts Sh. Gandhaka- 2 parts Swarna bhasma - 2 parts Raupya bhasma- 1 part Mukta bhasma- 1part Vaikranta bhasma- 1part	2 Ratti (250 mg) with Brishta Jeeraka Churna and Dadhi or Takra	Bhaishjya Ratnavali- Grahani 461-464	Kastha Sadhya Grahani vikara, Arsh shula, Atisara, Yakshma, Shotha, Kamala, Pandu, Pleea, Jalodar, Amlapitta Vatarakta, Krimi, Kustha, Prameha, Vishama Jwara, Rasayana and Vrishya.
6.	Gagana Parpati	Sh. Parada - 1 part Sh. Gandhaka - 2 parts Abhraka bhasma - 1 part	1-3 Ratti (125-375 mg) with Brishta jeeraka, Takra, Dugdha, Madhu and Dadimaswarasa	Siddha Yoga Sangrah- Sangrahani Adhyaya	Pandu, Grahani vikara, Atisara, Kshaya, Kasa, Shwasa, Mandagni
7.	Bola Parpati	Sh. Parada - 1 part Sh. Gandhaka - 1 part Bola Churna - 2 parts	3- 6 Ratti (375-750 mg) with Sharkara, Madhu, Navaneet, Durva Swarasa, Gulkanda	Yoga. Rat. Purvardha, Raktapitta Adhyaya	Raktasrava, Rakta atisara, Rakta arsha, Rakta pradara, Atyartava, Uraha kshata.
8.	Shweta Parpati	Surya kshara - 1 part Sphatika - 1/8 part Navsacara - 1/16 part	5-10 Ratti (625-1125 mg) with sheeta jala, Narikela Jala, Sharkara yukta dugdha, mutral kwatha,	Siddha Yoga Sangrah- Mutrakricha Adhyaya	Mutral, Swedjanan, Vatanulomaka, Ashmari, Mutrakriccha, Mutraghata etc.

K. Information of some of the work carried out on *Parpati Kalpanas*

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L. Analytical Parameters/ Modules for *Parpati Kalpana* preparations

The Standard Operating Procedure (SOP) of *Parpati* formulation is mentioned below: [28-31]

1. Description
Colour, Odour and Taste
2. Identification
Microscopy (wherever possible), Colour test, Chemical test (Group test) and TLC/HPTLC
3. Physico-chemical Parameters
Loss on drying at 105°C, Total- ash, Acid insoluble ash, Total solid, Water -soluble extractives, Alcohol -soluble extractives, pH and Volatile oil
4. Particle size
Bulk density and Tap density
5. TLC/HPTLC – Profile with marker (wherever available)
6. Assay for Constituents (Marker %, Major compounds like Alkaloids, flavonoids/saponin compounds.
7. Tests for heavy/toxic metals

Test for heavy/ Toxic metals	As per WHO / FDA (Permissible limit)
Lead	10.0 ppm
Cadmium	0.30 ppm
Mercury	1.00 ppm
Arsenic	10.0 ppm

8. Microbial contamination
Total viable aerobic count, Total enterobacteriaceae and Total fungal count
9. Test for specific pathogen
E. coli, Salmonella spp., S. aureus and Pseudomonas aeruginosa
10. Pesticide residue
Organochlorine pesticides, DDT (all derivatives), HCH (all their Isomers), Endosufan, Alderin used as standard, Organophosphorus pesticides, Malathion, Parathion and Pyrethroids

11. Test for Aflatoxine (B1, B2, G1, G2)
12. Lethal dose
13. Optimum effective dose/ Mode of administration
14. Shelf life
15. Packing and Labeling [32,33]

M. Glimpses of Analytical Study Conducted on Parpati Kalpana:

Padhi, Payodhar; Sahoo, G.; Das, K.; Ghosh, Sudipto; Panigrahi, S. C. on Synthesis of Black and Red Mercury Sulfide Nano-Powder by Traditional Indian Method for Biomedical Application. The study revealed following things [34];

1. In the present investigation, the same method was followed to synthesize the sulfides and the product was characterized using modern methods like XRD, SEM and HRTEM.
2. With increase in milling time the fineness of the powder increases, which increases the efficacy of the medicine, and free mercury, which is not desirable for medicinal application is found to decrease.
3. The powder obtained at the end of 48 hours of milling is found to be of a size finer than 10nm.
4. Mercury sulfide, mercuric sulfide, or mercury (II) sulfide is a chemical compound composed of the chemical elements mercury and sulfur.
5. It is represented by the chemical formula HgS.
6. It is virtually insoluble in water.
7. HgS is dimorphic with two crystal forms.
8. Red cinnabar (α -HgS, hexagonal, hP6, P3221), is the form in which mercury is most commonly found in nature.
9. Black, Meta cinnabar (β -HgS), is less common in nature and adopts the Zinc Blende (*T2d-F-43m*) crystal structure.
10. Crystals of red, α -HgS, are optically active. This is caused by the Hg-S helices in the structure.

CONCLUSION

Parpati for the first time was formulated in 8th century, in the name of *Rasa Parpati*. It is a *Murchana* variety, attaining *vyadhiharana*

(destroying the disease) property. *Mandagni*, *Gomay*, *Kadali*, *Parpatakara* have their own significances in *Parpati nirmana*. *Mridu* and *Madhyama Paka Parpati* are to be used *Khara paka* is *tyajya* (discarded). Its prime importance is in *Grahni vikara*. *Parpati* is a prestigious and dependable preparation in *Rasa Shasta* for the management of *Grahani*. It should be prepared carefully following the guide-lines given by various classical texts in regards to purification of mercury, sulphur and other materials and proper incineration of minerals and metals which are used for preparation of various *Parpati kalpana*. Then only *Parpati* becomes safe, effective and beneficial for therapeutic purpose.

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PHOTOGRAPHS OF *PARPATI KALPANA* PREPARATIONS (*RASA PARPATI*)



Kajjali added in ghrith lipta darvi



Proper mixing and avoiding lumps to form



Making Kalavata (Like muddy appearance)



Proper pressing to make flakes



Proper Parpati preparation is achieved



Formation like Papad (Flakes)